1. What is the specific speed of a turbine?

a) It is the speed at which the turbine operates under standard conditions
b) It is the speed at which the turbine delivers one unit of power with one unit of head
c) It is the speed at which the turbine operates at maximum efficiency
d) It is the speed at which the turbine rotates when no water is flowing

Answer: b) It is the speed at which the turbine delivers one unit of power with one unit of head

Explanation: Specific speed of a turbine is a dimensionless number representing the speed at which a turbine would operate if it were geometrically similar and dynamically similar to a reference turbine, delivering one unit of power with one unit of head.

2. What is the purpose of a draft tube in a reaction turbine?

a) To regulate the speed of the turbine
b) To increase the efficiency of the turbine
c) To prevent cavitation in the turbine
d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Answer: d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Explanation: A draft tube is used in reaction turbines to efficiently convert the kinetic energy of the water leaving the turbine into pressure energy, thereby increasing the overall efficiency of the turbine.

3. Which characteristic curve represents the relationship between flow rate and head in a centrifugal pump?

a) Efficiency curve
b) Power curve
c) Net positive suction head curve
d) Performance curve

Answer: d) Performance curve

Explanation: The performance curve of a centrifugal pump shows the relationship between the flow rate (capacity) and the head (pressure) developed by the pump under various operating conditions.

4. What is cavitation in pumps?

a) It is the process of water freezing inside the pump
b) It is the formation of bubbles in the liquid due to low pressure areas
c) It is the excessive vibration of the pump
d) It is the pump's inability to start

Answer: b) It is the formation of bubbles in the liquid due to low pressure areas

Explanation: Cavitation occurs when the pressure in a liquid drops below its vapor pressure, causing bubbles or cavities to form. These bubbles collapse violently, leading to damage to pump components and decreased efficiency.

5. What is the principle behind the working of a reciprocating pump?

a) It uses the momentum of a rotating impeller to move fluid
b) It uses the principle of centrifugal force to move fluid
c) It uses the back-and-forth motion of a piston or diaphragm to draw in and expel fluid
d) It uses the rotation of gears to move fluid

Answer: c) It uses the back-and-forth motion of a piston or diaphragm to draw in and expel fluid

Explanation: Reciprocating pumps operate by using the reciprocating motion of a piston or diaphragm to create a pressure difference, drawing fluid into the pump chamber on one stroke and expelling it on the other stroke.

6. What is the manometric head in a centrifugal pump?

a) It is the pressure head at the pump inlet
b) It is the pressure head at the pump outlet
c) It is the head developed by the pump due to its rotational speed
d) It is the head measured by a manometer connected to the pump

Answer: d) It is the head measured by a manometer connected to the pump

Explanation: The manometric head in a centrifugal pump is the head measured by a manometer connected to the pump, indicating the pressure difference between the pump inlet and outlet.

7. Which type of pump is more prone to cavitation, centrifugal or reciprocating?

a) Centrifugal

b) Reciprocating
c) Both are equally prone to cavitation
d) Neither is prone to cavitation

Answer: a) Centrifugal

Explanation: Centrifugal pumps are more prone to cavitation compared to reciprocating pumps due to the rapid changes in pressure within the pump, which can lead to the formation of cavities or bubbles in the liquid.

8. What is slip in a reciprocating pump?

a) It is the leakage of fluid from the pump chamber
b) It is the difference between theoretical discharge and actual discharge
c) It is the backflow of fluid due to valve inefficiencies
d) It is the noise produced by the pump during operation

Answer: b) It is the difference between theoretical discharge and actual discharge

Explanation: Slip in a reciprocating pump refers to the difference between the theoretical discharge (expected based on pump displacement) and the actual discharge (observed in practice), usually due to inefficiencies in the pump design or operation.

9. What is the specific speed of a pump?

a) It is the speed at which the pump operates under standard conditions
b) It is the speed at which the pump delivers one unit of power with one unit of head
c) It is the speed at which the pump operates at maximum efficiency

d) It is the speed at which the pump rotates when no fluid is flowing

Answer: b) It is the speed at which the pump delivers one unit of power with one unit of head

Explanation: Specific speed of a pump is a dimensionless number representing the speed at which a geometrically similar pump would operate if it were delivering one unit of power with one unit of head.

10. What is the purpose of a draft tube in a reaction turbine?

a) To regulate the speed of the turbine
b) To increase the efficiency of the turbine
c) To prevent cavitation in the turbine
d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Answer: d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Explanation: A draft tube is used in reaction turbines to efficiently convert the kinetic energy of the water leaving the turbine into pressure energy, thereby increasing the overall efficiency of the turbine.

11. What is the primary function of the draft tube in a reaction turbine?

a) To regulate the flow rate of water
b) To increase the rotational speed of the turbine
c) To convert the kinetic energy of water leaving the turbine into pressure energy
d) To minimize energy losses in the turbine

Answer: c) To convert the kinetic energy of water leaving the turbine into pressure energy

Explanation: The draft tube in a reaction turbine serves to convert the kinetic energy of water leaving the turbine into pressure energy by gradually increasing the cross-sectional area, thereby improving the efficiency of the turbine.

12. Which of the following is NOT a type of centrifugal pump?

a) Axial-flow pump
b) Radial-flow pump
c) Mixed-flow pump
d) Multistage pump

Answer: a) Axial-flow pump

Explanation: Axial-flow pumps are a distinct type of pump that operate differently from centrifugal pumps. They are designed to move fluid parallel to the pump shaft, while centrifugal pumps move fluid radially outward from the pump impeller.

13. What does the term “runaway speed” refer to in the context of turbines?

a) The maximum allowable speed of a turbine
b) The speed at which a turbine operates most efficiently
c) The speed at which a turbine will continue to accelerate uncontrollably
d) The minimum speed required for a turbine to function

Answer: c) The speed at which a turbine will continue to accelerate uncontrollably

Explanation: Runaway speed in turbines refers to the speed at which a turbine will continue to accelerate uncontrollably, often leading to catastrophic failure if not mitigated.

14. Which of the following components is NOT typically found in a centrifugal pump?

a) Impeller
b) Casing
c) Piston
d) Suction pipe

Answer: c) Piston

Explanation: Centrifugal pumps do not typically contain pistons. Instead, they rely on rotating impellers to impart kinetic energy to the fluid.

15. What is the coefficient of discharge in a reciprocating pump?

a) It is a measure of the pump’s efficiency
b) It is a measure of the pump’s reliability
c) It is a measure of the pump’s ability to maintain a constant flow rate
d) It is a measure of the ratio of actual discharge to theoretical discharge

Answer: d) It is a measure of the ratio of actual discharge to theoretical discharge

Explanation: The coefficient of discharge in a reciprocating pump represents the ratio of the actual discharge achieved by the pump to the theoretical discharge, providing insight into the pump’s performance.

16. In a centrifugal pump, what is the purpose of the impeller?

a) To increase the pressure of the fluid
b) To decrease the velocity of the fluid
c) To convert kinetic energy into pressure energy
d) To prevent cavitation

Answer: c) To convert kinetic energy into pressure energy

Explanation: The impeller in a centrifugal pump is responsible for converting the kinetic energy of the fluid into pressure energy by imparting velocity to the fluid.

17. Which characteristic curve of a centrifugal pump represents the relationship between head and flow rate?

a) Efficiency curve
b) Power curve
c) Net positive suction head curve
d) Performance curve

Answer: d) Performance curve

Explanation: The performance curve of a centrifugal pump illustrates the relationship between head (pressure) and flow rate (capacity) under various operating conditions.

18. What is the primary function of the draft tube in a reaction turbine?

a) To regulate the speed of the turbine

b) To increase the efficiency of the turbine
c) To prevent cavitation in the turbine
d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Answer: d) To convert the kinetic energy of the water leaving the turbine into pressure energy

Explanation: A draft tube in a reaction turbine is designed to efficiently convert the kinetic energy of water leaving the turbine into pressure energy, thereby enhancing the overall efficiency of the turbine.

19. Which of the following is a type of centrifugal pump?

a) Reciprocating pump
b) Gear pump
c) Diaphragm pump
d) Submersible pump

Answer: d) Submersible pump

Explanation: A submersible pump is a type of centrifugal pump designed to be submerged in the fluid it is pumping, commonly used in applications such as groundwater pumping and sewage systems.

20. What is the primary purpose of a centrifugal pump?

a) To increase the pressure of a fluid
b) To decrease the pressure of a fluid

c) To control the temperature of a fluid
d) To mix two or more fluids

Answer: a) To increase the pressure of a fluid

Explanation: The primary function of a centrifugal pump is to increase the pressure of a fluid by imparting kinetic energy to it through the rotation of an impeller, thereby enabling it to overcome resistance and flow through a piping system.

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